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**Comparative study of tribological behavior during running-in period of TiN hard coatings deposited by magnetron sputtering, cathodic arc and thermoionic arc ion plating**

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In this paper we compared tribological behavior of TiN hard coatings deposited by magnetron sputtering, cathodic arc and themionic arc ion plating. The investigations were made for the running-in period of a sliding test. The microstructure, crystal structure, topography, adhesion and microhardness of TiN hard coatings were determined in scanning electron microscope by focused-ion-beam, an X-ray spectrometer, 3D-profilometry, scratch test and microindentation. We found a significant difference in the microstructural, morphological, and mechanical properties. The tribological characteristics of coated samples in sliding contact with an alumina ball were evaluated by ball-on-disc test equipment, where motion was reciprocal. The influences of post-polishing of the coating and the surrounding atmosphere were also investigated. Sliding tests have shown that different structure and topography of the three TiN coatings resulted in different friction and wear especially during the running-in period.

**Keywords**

PVD hard coating

tribology

cathodic arc

magnetron sputtering

themionic arc ion plating